UTILIZATION OF STONES FOR SHELTER BY LAND SNAILS

By WILLIAM MARCUS INGRAM

This paper is introduced after reading Baker (1898), W. G. Binney and Bland (1869), W. G. Binney (1885), and A. Binney (1851) who generally state that land mollusks may be collected under stones. Simpson (1901) states that individuals of *Triodopsis albolabris* (Say) are frequently found under stones. With this in mind 1350 stones were overturned on the Edmund Niles Huyck Preserve, Rensselaerville, Albany County, New York, between June 15 and September 1, 1940, in an attempt to determine the snail fauna that one might expect to find beneath them.

Stones in the following areas of the preserve were rolled over: beech-maple, beech-hemlock, and maple woods; flood-plain forest; hedge rows; abandoned grass and berry covered fields and apple orchards; and bogs. Only 3 of approximately 5,000 snails which were observed on the preserve were taken from beneath stones; these were 3 *Anguispira alternata* (Say), collected beneath 2 stones bordering a maple hedge row. In beech-maple, beech-hemlock, and maple areas where decaying logs and humus were found over moist soil, the snails limited themselves to these habitats rather than seeking shelter beneath stones. In hemlock and in flood-plain forest areas logs were preferred in the former and water-carried debris piles, consisting of accumulated sticks, soil, dead grass, and humus, in the latter. In hedgerows of beech, maple, or oak the fallen leaf cover was the typical snail abode. In grass and berry-covered fields and abandoned apple orchards where stones were present grass roots and berry roots were snail havens. In bogs, yellow birch logs and frond-strewn hummocks covered by bog ferns provided snail shelter. The following were the land snails which were found on the Huyck preserve:

Polygyridae

Triodopsis albolabris (Say)
T. tridentata (Say)
T. notata (Deshayes)
T. dentifera (Binney)
Stenotrema fraternum (Say)

Zonitidae

Mesomphix cupreus (Rafinesque)
M. inornatus (Say)
Euconulus fulvus (Müller)
Zonitoides arboreus (Say)
Ventridens intertexus (Binney)

Endodontidae

Anguispira alternata (Say)
Discus cronkhitei catskillensis (Pilsbry)
Helicodiscus parallelus (Say)

Haplotrematidae

Haplotrema concavum (Say)

Cochlicopidae

Cochlicopa lubrica (Müller)

Succineidae

Succinea ovalis Say
S. retusa Lea

During the late fall of 1940 at Ithaca, New York, the ground beneath stones was examined for snails in Six Mile Creek. Here a small flood-plain of approximately three acres is stone-strewn; the forest is sparsely scattered sycamore. In the area examined logs were entirely absent and water-carried debris piles were lacking. Due to the rocky character of the plain the sycamore leaf humus does not become packed, but is uptilted by the numerous stones thus allowing the soil beneath to become very dry in the fall. Here 265 snails were collected from beneath 956 stones; only one individual, *Triodopsis albolabris*, was taken from beneath sycamore leaf humus. The flood-plain species were:

Polygyridae

Stenotrema hirsutum (Say)
Triodopsis albolabris (Say)
T. tridentata (Say)
Mesodon thyroidus (Say)

Haplotrematidae

Haplotrema concavum (Say)

Zonitidae

Mesomphix cupreus (Rafinesque)
Ventridens intertextus (Binney)

Endodontidae

Anguispira alternata (Say) *Helicodiscus parallelus* (Say)

Succineidae

Succinea ovalis Say *S. retusa* Lea

These data are indicative in the areas studied that snails prefer shelter beneath humus and logs (where moist soil exists), to shelter beneath stones where the three are found together on the forest floor. When logs and debris piles are not available snails seek shelter beneath stones rather than remain on top of the substratum beneath humus where the soil is dry.

To further observe the selection of shelter by land snails between the stone and log-humus habitat, several species were removed from the Six Mile Creek area and were carried into a beech woods. Here stones, logs, and humus were abundantly distributed over a moist forest floor. Twenty individuals representing *T. albolabris*, *T. tridentata*, *H. concavum*, and *M. cupreus* were removed to a staked-off area in the beech woods. In 24 hours all twenty were established beneath the log-humus habitat. Further examination of the area 30 days later showed that none had sought shelter beneath the available stones, but of 14 individuals that the writer was able to locate all were in the log-humus habitat.

Bibliography

Baker, F. C. 1898. The mollusca of the Chicago area, pt. 1: Pelecypoda. Chicago Acad. Sci., Bull. 3, p. 26.

Binney, A. 1851. The terrestrial air-breathing mollusks of the United States, etc., p. 47. Boston, Charles C. Little & J. Brown.

Binney, W. G., and T. Bland. 1869. Land and fresh water shells of North America, pt. 1: Pulmonata Geophila. Smiths. Misc. Collec., no. 194, p. 2.

Binney, W. G. 1885. A manual of American land shells. U. S. N. Museum Bull., 28, p. 11.

Simpson, G. B. 1901. Anatomy and physiology of Polygyra albolabris and Limax maximus, etc. New York State Museum Bull., 40, vol. 8, p. 243.

A NEW RACE OF *PARAPHOLYX EFFUSA*

By Frank C. Baker

Parapholyx effusa klamathensis nov. var. Fig. 1.

Shell differing from typical *effusa* in being twice as large, much thinner, the body whorl more voluminous; the aperture is larger, higher than wide and in adult specimens more effuse; the lower part of the aperture is more angular; the columella is thinner and less indented and the inner lip is narrowly reflected over the columellar region, but not as tightly as in *effusa*; there is sometimes a small umbilical chink; in immature shells the aperture is much higher than wide. Color greenish horn to light brown;

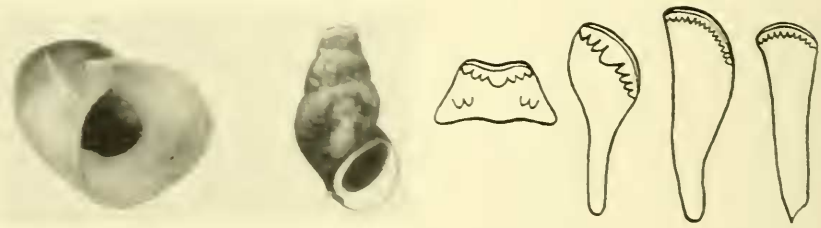

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Fig. 1. *Parapholyx effusa klamathensis*. Figs. 2, 3, *Hypsobia tanyi*.

sculpture of fine growth lines crossed by fine spiral lines. Edge of lip thin and sharp.

H. 11.3; M. diam. 14.0; L. diam. 9.3; Aperture H. 9.4; D 8.5 mm. Holotype

H. 10.5; M. diam. 13.3; L. diam. 9.2; Aperture H. 9.0; D 8.5 mm. Paratype

H. 9.5; M. diam. 13.0; L. diam. 9.0; Aperture H. 8.2; D 8.0 mm. Paratype

Type locality: East side Upper Klamath Lake, 13 miles north of Klamath Falls, Klamath Co., Oregon. Collected by H. B. Baker. Types in U.S.N.M., No. 406024.

Some 50 specimens of this large form of *effusa* have been examined and it appears racially distinct from the smaller type form found in California. It is related to *Parapholyx maillardi* Hanna from Eagle Lake, Cal., differing in being larger and thinner with a narrower columella less deeply indented. The aperture is rounder and is not sharply angular below, as in *mail-*